# Process Signal Monitoring

**The cost of downtime is substantial - an even greater cost is incurred when trying to troubleshoot intermittent events. ACR Data Loggers provide an effective means of collecting and presenting data from Analog I/O.**

In process automation, few areas of operation are left to guesswork. However, often critical parameters are not recorded due to complexities and limitations of the equipment. The field technician is expected to find and diagnose irregularities that occur and provide data to validate performance. Installing a Process Signal Data Logger attached to existing analog I/O will reveal information not otherwise obtainable. A portable 10-year self-powered data logger is versatile in that it can be deployed easily without reworking the system. Critical parameters are recorded 24/7 - 365 days a year regardless whether the system is powered or online.
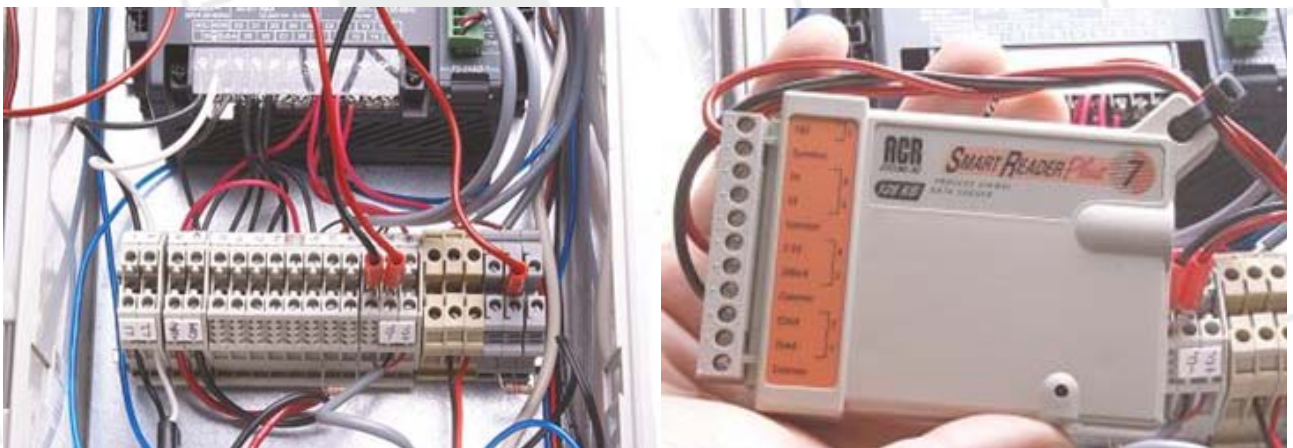


## Challenge:

Know where and how to connect to existing transducers. 4-20mA current loops are predominant in industry as they provide a generic signal that is well understood. The challenge is measuring them without upsetting the process.

Are you faced with?
■ Not knowing how to connect to existing transducers.
■ Recording multiple analog signals.
■ Finding the most cost effective solution.

When measuring current loops the immediate reaction is to open the circuit to insert a current monitor – this is not always possible. Non-isolated Analog Input modules have the commons on all the channels tied together and the same holds true for self-powered multi-channel Data Loggers (since isolation comes at the cost of increased power). This creates a wiring dilemma since there is no way to insert a non-isolated multi-channel current sensing monitor into the system.

## Solution:

Use multi-channel Voltage Data Logger to monitor Current Inputs eliminating the need for isolators – this has the added benefit of not having to interrupt the wiring. Base the Voltage range on the value of the load resistor.

| Loop Resistance | Input Range |
| --- | --- |
| 500Ω | 10V |
| 250Ω | 5V |
| 125Ω | 2.5V |

ACR
24/7/365
**10yr**
Battery

In the case of Analog Outputs, it is possible to measure the signals with Voltage channels however the accuracy can be affected if the cable runs are long. This is usually tolerable especially if determining the order of magnitude of the signal and is useful in troubleshooting feedback control loops. Alternatively, move the Data Logger to the field connecting as close to the termination resistor as possible to get an accurate measurement. Connect Data Logger inputs to the appropriate Test Points – Voltage Channel (Vch) for each of the Measurement Transducers (MT) or Current Sources (CS) and negative DC (Com).
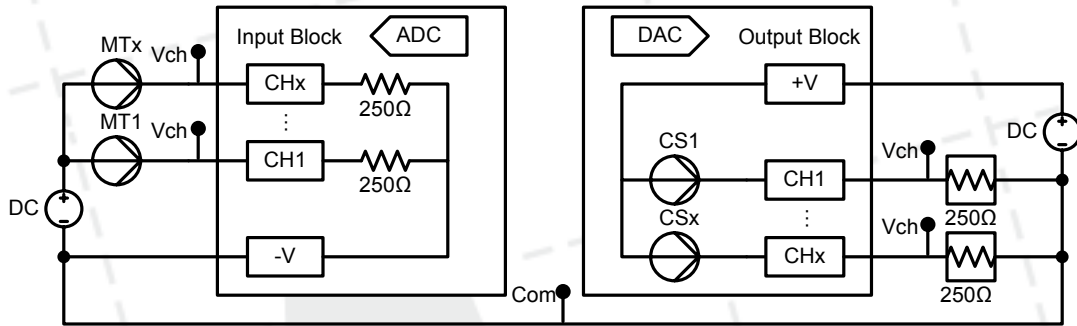


Current Loop I/O w/ Test Points





Discharge Outlet
Flow Rate
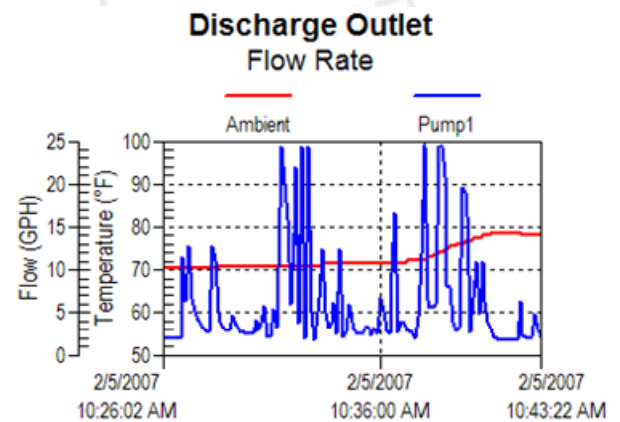
## Deploying the data logger and downloading the information is easy...

*CAUTION: CHECK THAT CHANNEL VOLTAGE MATCHES LOAD RESISTANCE BEFORE CONNECTING*
1. Simply wire the field terminals to the ACR SmartReader Plus Data Logger.
2. Connect the logger to an Interface Cable and with TrendReader software installed on your computer, view the real-time readings by establishing a Connection, Setup the channel configuration and sample interval then disconnect.
3. Backup the Data Logger to see the recorded data in graphical form and export tabular data for further analysis.

TIP: Custom equations can be created and applied to individual channels to allow display of real world units.

## Ordering Information:

| Equipment | Description | Catalog No. |
|---|---|---|
| SmartReader Plus 7-2.5V | 21,500 Readings, 1.8 days @ 1min 8 channels | 01-0018 |
| SmartReader Plus 7-2.5V-128K | 87,000 Readings, 7.5 days @ 1min 8 channels | 01-0127 |
| SmartReader Plus 7-5V | 21,500 Readings, 1.8 days @ 1min 8 channels | 01-0107 |
| SmartReader Plus 7-5V-128K | 87,000 Readings, 7.5 days @ 1min 8 channels | 01-0124 |
| SmartReader Plus 7-5V-1.5M | 1,048,000 Readings, 90.9 days @ 1min 8 channels | 01-0154 |
| SmartReader Plus 7-10V | 21,5000 Readings, 1.8 days @ 1min 8 channels | 21-0020 |
| SmartReader Plus 7-10V-128K | 87,000 Readings, 7.5 days @ 1 min 8 channels | 21-0125 |
| SmartReader Plus 7-10V-1.5M | 1,048,000 Readings, 90.9 days @ 1min 8 channels | 21-0155 |
| TrendReader 2 Serial Interface Pkg. | Software on CD, IC-101 Interface Cable | 01-0225 |
| TrendReader 2 USB Interface Pkg. | Software on CD, IC-102 Interface Cable | 01-0226 |

Note: Multiply number of days by sample factor to get session length. i.e. 10min = days X 10 which is 18, 75 and 909 days for 21,500, 87,000 and 1,048,000 Readings respectively.